

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

- 1 1. (Original) A read channel, comprising:
2 an equalizer configured to equalize a digital signal to provide equalized
3 reproduced signals; and
4 a Viterbi detector capable of receiving the equalized reproduced signals and
5 converting the reproduced signals into a digital output signal indicative of data stored on
6 a recording medium;
7 wherein the equalizer is implemented using a lengthened equalization target
8 wherein the lengthened equalization target comprises a mathematical convolution of a
9 first and a second transfer function, the first transfer function comprising a predetermined
10 equalization target for providing desired shaping to the read signal and the second
11 transfer function comprising a matched filter function providing a time-reversed
12 component that is a time-reversed replica of a whitening filter component of the
13 equalization target.
- 1 2. (Original) The read channel of claim 1, wherein the predetermined
2 equalization target comprises a 16-state equalization target having a length of 7.
- 1 3. (Original) The read channel of claim 1, wherein lengthened
2 equalization target is symmetrical and comprises only two programmable parameters.

1 4. (Original) The read channel of claim 1, wherein coefficients of the
2 lengthened equalization target are independently adjustable while maintaining a DC null
3 and a desired Nyquist null.

1 5. (Original) The read channel of claim 1, wherein the lengthened
2 equalization target comprises a base partial response component, a fractional coefficient
3 polynomial component and a time-reversed replica of the fractional coefficient
4 polynomial component.

1 6. (Original) The read channel of claim 1, wherein the lengthened
2 equalization target has the form $(1-D^2)(1+p_1D+p_2D^2)(p_2+p_1D+D^2)$.

1 7. (Original) The read channel of claim 1, wherein the lengthened
2 equalization target has the form $(1+aD+bD^2-bD^4-aD^5-D^6)$, wherein a is equal to $(p_1/p_2) +$
3 p_1 and b is equal to $((p_1^2+1)/p_2)+p_2-1$.

1 8. (Original) The read channel of claim 7, wherein a and b are
2 programmable.

1 9. (Original) A signal processing system, comprising:
2 memory for storing data therein; and
3 a processor, coupled to the memory, for equalizing a digital signal to provide
4 equalized reproduced signals using a lengthened equalization target, wherein the
5 lengthened equalization target comprises a mathematical convolution of a first and a
6 second transfer function, the first transfer function comprising a predetermined
7 equalization target for providing desired shaping to the read signal and the second
8 transfer function comprising a matched filter function providing a time-reversed
9 component that is a time-reversed replica of a whitening filter component of the
10 equalization target.

1 10. (Original) The signal processing system of claim 9, wherein the
2 predetermined equalization target comprises a 16-state equalization target having a length
3 of 7.

1 11. (Original) The signal processing system of claim 9, wherein
2 lengthened equalization target is symmetrical and comprises only two programmable
3 parameters.

1 12. (Original) The signal processing system of claim 9, wherein
2 coefficients of the lengthened equalization target are independently adjustable while
3 maintaining a DC null and a desired Nyquist null.

1 13. (Original) The signal processing system of claim 9, wherein the
2 lengthened equalization target comprises a base partial response component, a fractional
3 coefficient polynomial component and a time-reversed replica of the fractional
4 coefficient polynomial component.

1 14. (Original) The signal processing system of claim 9, wherein the
2 lengthened equalization target has the form $(1-D^2)(1+p_1D+p_2D^2)(p_2+p_1D+D^2)$.

1 15. (Original) The signal processing system of claim 9, wherein the
2 lengthened equalization target has the form $(1+aD+bD^2-bD^4-aD^5-D^6)$, wherein a is equal
3 to $(p_1/p_2) + p_1$ and b is equal to $((p_1^2+1)/p_2)+p_2-1$.

1 16. (Original) The signal processing system of claim 15, wherein a and b
2 are programmable.

1 17. (Original) An equalizer implemented in accordance with a lengthened
2 equalization target wherein the lengthened equalization target comprises a mathematical
3 convolution of a first and second transfer function, the first transfer function comprising a
4 predetermined equalization target for providing desired shaping to the read signal and the
5 second transfer function comprising a matched filter function providing a time-reversed
6 component that is a time-reversed replica of a whitening filter component of the
7 equalization target.

1 18. (Original) The equalizer of claim 17, wherein lengthened equalization
2 target is symmetrical and comprises only two programmable parameters.

1 19. (Original) The equalizer of claim 17, wherein coefficients of the
2 lengthened equalization target are independently adjustable while maintaining a DC null
3 and a desired Nyquist null.

1 20. (Original) The equalizer of claim 17, wherein the lengthened
2 equalization target comprises a base partial response component, a fractional coefficient
3 polynomial component and a time-reversed replica of the fractional coefficient
4 polynomial component.

1 21. (Original) The equalizer of claim 17, wherein the lengthened
2 equalization target has the form $(1-D^2)(1+p_1D+p_2D^2)(p_2+p_1D+D^2)$.

1 22. (Original) The equalizer of claim 17, wherein the lengthened
2 equalization target has the form $(1+aD+bD^2-bD^4-aD^5-D^6)$, wherein a is equal to $(p_1/p_2) +$
3 p_1 and b is equal to $((p_1^2+1)/p_2)+p_2-1$.

1 23. (Original) The equalizer of claim 22, wherein a and b are
2 programmable.

1 24. (Original) A magnetic storage device, comprising:
2 a magnetic storage medium for recording data thereon;
3 a motor for moving the magnetic storage medium;
4 a head for reading and writing data on the magnetic storage medium;
5 an actuator for positioning the head relative to the magnetic storage medium; and
6 a data channel for processing encoded signals on the magnetic storage medium,
7 the data channel comprising an equalizer implemented in accordance with a lengthened
8 equalization target wherein the lengthened equalization target comprises a mathematical
9 convolution of a first and second transfer function, the first transfer function comprising a
10 predetermined equalization target for providing desired shaping to the read signal and the
11 second transfer function comprising a matched filter function providing a time-reversed
12 component that is a time-reversed replica of a whitening filter component of the
13 equalization target.

1 25. (Original) The magnetic storage device of claim 24, wherein the
2 predetermined equalization target comprises a 16-state equalization target having a length
3 of 7.

1 26. (Original) The magnetic storage device of claim 24, wherein
2 lengthened equalization target is symmetrical and comprises only two programmable
3 parameters.

1 27. (Original) The magnetic storage device of claim 24, wherein
2 coefficients of the lengthened equalization target are independently adjustable while
3 maintaining a DC null and a desired Nyquist null.

1 28. (Original) The magnetic storage device of claim 24, wherein the
2 lengthened equalization target comprises a base partial response component, a fractional
3 coefficient polynomial component and a time-reversed replica of the fractional
4 coefficient polynomial component.

1 29. (Original) The magnetic storage device of claim 24, wherein the
2 lengthened equalization target has the form $(1-D^2)(1+p_1D+p_2D^2)(p_2+p_1D+D^2)$.

1 30. (Original) The magnetic storage device of claim 24, wherein the
2 lengthened equalization target has the form $(1+aD+bD^2-bD^4-aD^5-D^6)$, wherein a is equal
3 to $(p_1/p_2) + p_1$ and b is equal to $((p_1^2+1)/p_2)+p_2-1$.

1 31. (Original) The magnetic storage device of claim 30, wherein a and b
2 are programmable.

1 32. (Currently Amended) An equalizer implemented in accordance with
2 means for shaping a channel impulse response ~~to a desired target shape~~ to a lengthened
3 equalization target, wherein the means for shaping comprises ~~a first means for~~ means for
4 convoluting a first and a second transfer function, wherein the first transfer function
5 comprising a predetermined equalization target for providing desired shaping to the read
6 signal and ~~a second means for~~ the second transfer function comprising a matched filter
7 function providing a time-reversed component that is a time-reversed replica of a
8 whitening filter component of the ~~means for shaping~~ lengthened equalization target.